

1. Purchasing

Service parts procurement is achieved by placing different types of purchase order with the supplier; usually a factory belonging to the company, a central supply department or a third party supplier. The main types of order are:

- IRPO (Initial Repair Parts Order). This order is placed well before release of a new product or model, taking into account the delivery lead time from the supplier as well as the time needed to unpack, catalogue new part numbers (or item codes / SKU) onto the WOS (Warehouse Operating System) and / or other software used and assign storage locations to parts not previously stocked. Predicting requirements for new products is always difficult and requires high levels of skill and knowledge of the products involved. Input from technical people in the repair/technical support departments can be very valuable in this regard. A word of warning though, it has been my experience that technicians would like every part for every model to be in stock all the time as this makes their job easier. Ideal as this sounds it is neither practical nor financially sensible. Their suggestions should be combined with previous experience with similar products as well as cost and storage space considerations to determine initial order items and quantities. A good rule of thumb is to cater for 3 - 6 months demand, taking the projected product sales into account. By the time this stock is running low there should be enough usage data to place further orders based on actual usage rather than projected usage.
- Urgent orders to cover back orders on slow moving or out of stock items. These are generally monitored daily and placed immediately by the fastest shipping method. In the case of out of stock fast and medium moving items investigation also needs to be done as to how the stock ran out. If necessary extra replenishment orders should be placed.
- Replenishment (Re-stocking) Orders. Accurately predicting demand for service parts is a combination of skill and luck in many cases as product failures do not always follow a set pattern. Certain classes of parts are more prone to failure so a high degree of accuracy can be achieved by careful and continual monitoring of usage information.

To guide the placing of replenishment orders three things are necessary:

- A clear policy on movement classes and required stock levels.
- Detailed analysis of usage and classification of parts into movement classes (e.g. Fast, Medium, Slow Moving)
- Understanding of suppliers total lead time (time taken from placing of purchase order to delivery), bearing in mind different shipping methods (Air, Sea).

Sample calculations for replenishment logic:

Movement Grades & Stocking Policy

Mth Demand (Qty)	Grade	Max Stock (Days)	Min /Safety Stock (Days)	Re-Order Point (Days)*
>500	A	120	60	70
>200	B	90	45	55
>100	C	60	30	40
=/>10	D	30	15	25
9 & below	E	0	0	0

* Min + Avg LT - assuming 10 days in this case

Sales Quantity Analysis

Month	Jan	Feb	Mar	Apr	May	Jun	Total	Avg (Mth)	Avg (Day)
Sales Days	20	20	22	19	21	21	123		
Part1	667	771	820	730	600	581	4169	694.83	5.65
Part2	257	234	242	211	249	233	1426	237.67	1.93
Part3	97	111	89	126	99	105	117	104.50	0.85
Part4	11	9	13	10	6	12	61	10.17	0.08
Part5	1	0	2	1	1	1	6	1.00	0.01

Purchase Quantity Calculation

	Demand Avg (Day)	Grade	Avg LT (Days)	SOH (Qty)	Max Inv Qty	Min Inv Qty	Re-Order Point	Required	OS PO	Transit Qty	PO Qty
Part1	5.65	A	10	350.00	677.89	338.94	395.43	384.38	30.00	15.00	339
Part2	1.93	B	10	96.00	173.90	86.95	106.27	97.22	17.00	5.00	75
Part3	0.85	C	10	26.00	50.98	25.49	33.98	33.47	0.00	9.00	24
Part4	0.08	D	10	3.00	2.48	1.24	2.07	0.31	0.00	0.00	0
Part5	0.01	E	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0

Calculation of required qty: $(Max - SOH) + (Avg \text{ daily demand} \times Avg \text{ LT})$

Calculation of PO Qty: $Required - OS \text{ PO} - Transit \text{ Qty}$

Key to Terms & Abbreviations

Mth	Month
Qty	Quantity
Max	Maximum
Min	Minimum
Avg	Average
Inv	Inventory (stock)
SOH	Stock on Hand - same as inventory quantity / total
PO	Purchase Order i.e. Official request to a supplier to supply goods under terms and conditions as agreed to
Sales Days	Amount of days in a month on which orders were accepted & fulfilled
Transit	Also referred to as in-transit. Stock that has left the supplier against a purchase order but not yet delivered and received into stock at the customer.

The information contained in this article is intended to be a simple overview of parts purchasing, not an exhaustive or detailed treatment of the subject. Replenishment systems by their nature can be very complex but also very interesting. It takes a lot of experience as well as good database management skills to get the mix right.